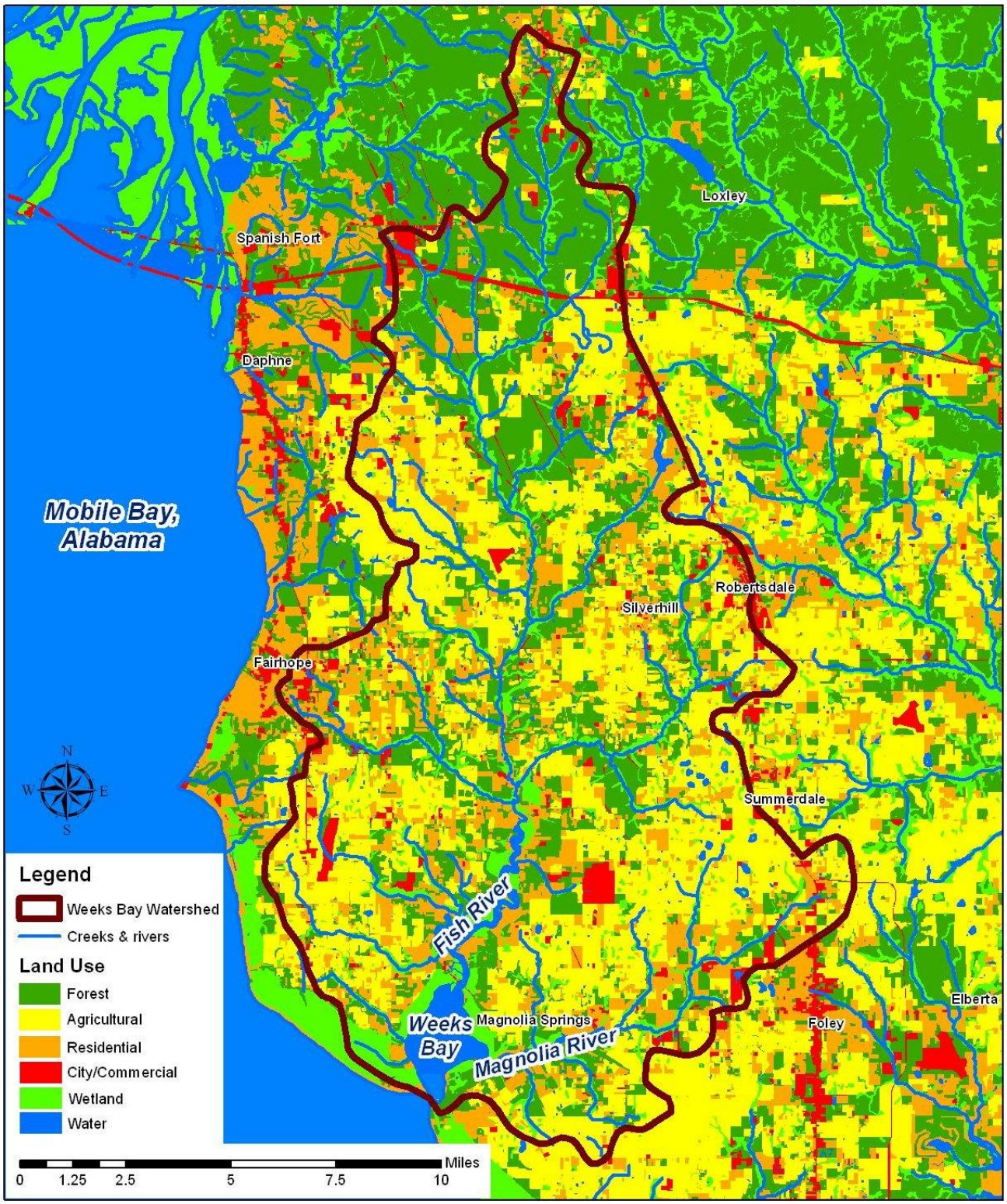
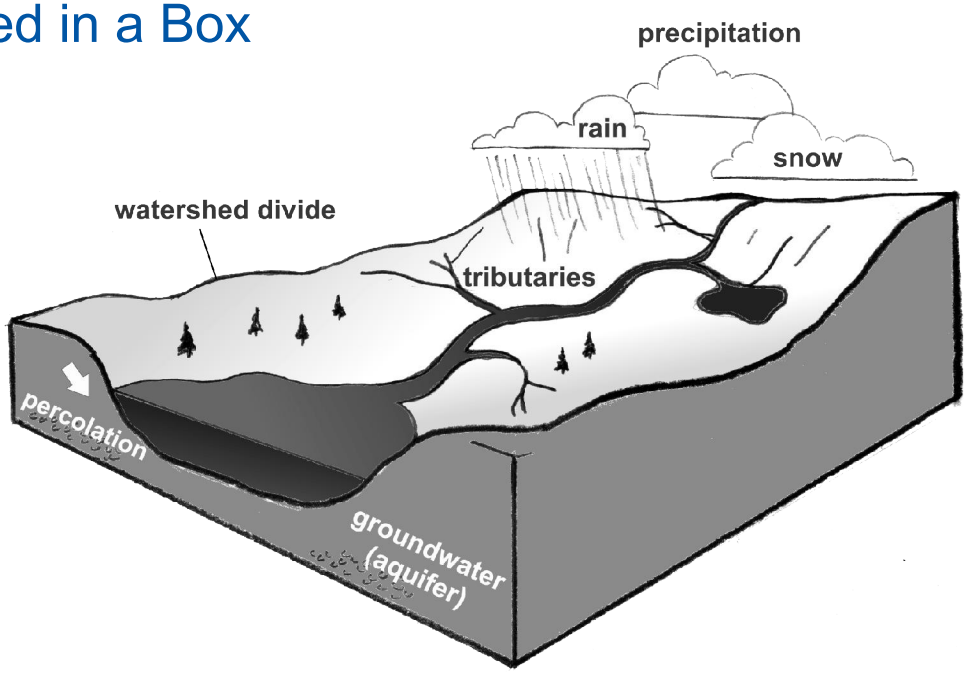
TEACHER MASTER

Weeks Bay Watershed Land Use Map



STUDENT MASTER

Watershed in a Box



A watershed — or drainage basin — is an area of land in which much of the precipitation that falls runs off to the same downhill location. Every watershed consists of boundaries (also called divides) and the basin they surround. The water within the watershed flows from higher elevations to lower elevations moving toward the basin.

The runoff water and whatever is carried with it gets carried into surface water bodies, such as streams and tributaries, rivers, lakes or oceans and into the groundwater. In this exercise, you are going to build your own model watershed and use it to explore how water and pollutants move through the watershed.

Procedure

1. Arrange pieces of crumpled paper in the bottom of the aluminum pan to represent hills and landforms of the watershed.
2. Cover the crumpled paper land forms with a large piece of aluminum foil, shiny side up.
3. Use a blue permanent marker to draw the river and streams in the main valley and tributary valleys of your model. Draw directly on the foil.
4. The area at the lower end of the river is your model's estuary. If the model were larger, you might see that eventually the estuary would lead into the ocean.
5. Use permanent markers to show different ways in which land is naturally covered in the watershed. Draw directly on the foil and show things such as fields, wetlands, forests, pastures, etc.
6. Shake unsweetened hot cocoa mix onto one of the field areas. This will represent an area of bare soil.
7. Next use markers to draw places on your watershed model that reflect how humans use the land. Draw such things as roads, homes, shopping centers, cities, factories, parking lots, etc.

Materials

Per student

- Student Master: Watershed in a Box

Per team

- 1 aluminum roasting pan
- Permanent markers, variety of colors
- Crumpled paper
- Aluminum foil
- 2 types of unsweetened powdered drink mixes
- Unsweetened hot cocoa mix
- 3 empty salt shakers (optional)
- Spray bottle with water

8. Continue work on the watershed model by using a different color powdered drink to represent different pollutants.
9. Start by shaking one of the pollutant colors on an agriculture area of your model.
10. Shake another pollutant color on an urban area.
11. Use the spray bottle to gently mist water onto your agricultural and urban areas. What does this water represent? Record what happens to the rain falling on these areas. Where does the polluted runoff go?
12. Describe what happens when two different pollutants run into the same area.

Questions

Q1. What is a watershed?

Q2. List several types of land cover and land uses found in your watershed model.

Q3. When the polluted runoff from the farm and urban areas flowed into your model's estuary, was it easy to tell where it came from? Why or why not?

Q4. Water pollution is often categorized in two ways:

- Non-point source water pollution comes from many different sources, such as oil and gas from the many roadways in a city or pesticides from many adjacent farms.
- Point source water pollution is pollution from a single source at a specific location, such as a sewage outfall or oil spill.

Based on those two definitions, answer the following:

Runoff enters an estuary from an urban area upstream. The runoff is carrying cooking oils from restaurants and salt washed from streets after winter snows. Is this an example of point source or non-point source pollution?

An oil supertanker sinks in a storm and results in oil spill. Is this an example of point source or non-point source pollution?

Q5. The estuary is located near the ocean, which is the final stop for all the water draining out of the watershed. How do you prevent water pollutants from the watershed from entering the estuary?

Q6. The title of this exercise is, *The Oil Spill – The Rest of the Story*. What is the rest of the story?